

OUR ASTRONOMICAL COLUMN.

OBSERVATIONS OF JUPITER'S GREAT RED SPOT.—In No. 4034 of the *Astronomische Nachrichten* Mr. Stanley Williams gives the results of the observations of the Great Red Spot on Jupiter made by him during the period June 20, 1904—January 21, 1905.

During this opposition the phenomena proved of exceptional interest on account of the vagaries in the relative motions of the Red Spot and its immediately surrounding features.

When the first observation was made, on June 20, it was seen that the immense mass of dark material, known as the south tropical disturbance, had, after making a complete circuit of the planet, again overtaken and enveloped the Red Spot. On July 26 nearly all this dark material had drifted past the Red Spot, which in August was quite separate, but very faint.

Mr. Williams's observations also afforded further evidence of the variable rate of motion of the Great Red Spot.

SUN-SPOT SPECTRA.—During the year ended March, 1905, Mr. W. M. Mitchell, of the Princeton Observatory (N.J.), made an exhaustive series of observations of that part of the sun-spot spectrum which is included between F and a. These observations took note of the two separate features of the spot spectrum:—(1) the nearly continuous absorption known as the spot-band, and (2) the affected Fraunhofer lines. A rapid survey of the whole region was first made on each observing day, and was followed by an exhaustive examination of some smaller portion. In regard to the first of the above features, Mr. Mitchell arrived at the conclusion that the band-lines are lines which do not appear in the Fraunhoferic spectrum at all, and he submits facts in favour of this view.

In observing the affected Fraunhoferic lines, the observer recorded nine different phenomena (e.g. widening, reversal, obliteration, &c.), and in his table of the 680 lines which he observed in the spot spectrum, he classifies each line according to the manner in which it was affected. The intensities of the widened lines, their intensities in the normal solar spectrum, the number of times each line was observed, and various other details concerning the affected lines are also recorded in the table.

Each element involved is then considered separately, and a number of valuable conclusions are deduced. Whilst vanadium and titanium are the most important elements concerned in sun-spots, as previously shown by Young, Cortie, and Lockyer, Mr. Mitchell finds that manganese plays an important rôle, 45 per cent. of its lines being affected. A striking comparison is drawn between the behaviour of certain manganese lines in the successive observations of the great sun-spot of February last. On February 3 and 4 they were noted as being strongly reversed, whereas on March 3 they were no longer reversed, but were excessively widened and very hazy.

The following general conclusions were arrived at by Mr. Mitchell, and agree, in general, with those recently published by Prof. Fowler in the Monthly Notices:—(1) Lines frequently seen in the chromosphere are, with two exceptions, but little affected in spots; (2) high-level chromospheric lines are not affected in spots; (3) lines greatly affected in spots are seen but rarely in the chromosphere.

From his observations and conclusions Mr. Mitchell deduces that sun-spots are, at least, below the chromosphere, and are probably caused by the heated vapours from the lower levels oozing through and vaporising the clouds of the photosphere (*Astrophysical Journal*, No. 1, vol. xxii.).

AN INTERESTING ASTEROID, OCCLIO [475].—Owing to its large southerly declination, -62° , at the time of its discovery, the minor planet Occlio was looked upon as of special interest, and when the orbit was computed and found to have a greater eccentricity than that of any other known asteroid the interest in this object was increased. This great eccentricity suggested that Occlio might be looked upon as the connecting link between the asteroids and the periodic comets. In order that the object should not be lost sight of, Prof. Kreutz had an ephemeris for 1905 computed, and this was communicated to Mr.

R. H. Frost at Arequipa, who successfully photographed the planet's trail, with the 24-inch Bruce telescope, in April, 1904. The plates have now been measured by Mrs. Fleming, and the positions of both ends of the trail on April 4 and on April 7 determined. The results are given in Circular No. 101 of the Harvard College Observatory.

OBSERVATIONS OF PHOEBE.—Saturn's ninth satellite, Phoebe, was photographed by Mr. R. H. Frost at Arequipa on four nights during May, and the following positions have been obtained from measurements of the plates:—

Date 1905	G.M.T. h. m.	Exp. m.	Dist. m.	Difference in decl.	Position angle
				$+5^{\circ}8'$	$56^{\circ}8'$
May 9	21 3	112	10'6
" 10	20 40	120	11'0	...	$+6^{\circ}4'$
" 12	20 49	120	11'6	...	$+6^{\circ}3'$
" 13	20 48	145	12'0	...	$+6^{\circ}6'$

The above quantities all refer to the position of the satellite in regard to Saturn's centre. A comparison of these positions with those computed from Dr. Ross's ephemeris shows that on the mean date, May 11, the computed distances should be diminished by $0^{\circ}.3$, and the position-angles should be increased by $0^{\circ}.9$ (Harvard College Observatory Circular, No. 102).

PERIODS OF THE VARIABLE STARS S SAGITTÆ AND Y OPHIUCHI.—From a discussion of the observations made by himself, combined with those of other observers, M. M. Luizet has deduced the following elements for the light-curve of the variable star S Sagittæ (Ch. 7149):—

$$\text{Maximum } 2409863^{\circ}33 \text{ (M.T. Paris)} \} + 8^{\circ}38209d. (E. - 389) \\ \text{Minimum } 2409860^{\circ}37 \text{ , , }$$

The light-curve of this star presents a double oscillation, and, according to M. Luizet's scale, the magnitude varies between $5^{\circ}4$ and $6^{\circ}2$.

For Y Ophiuchi (Ch. 6404), the same observer finds that M. Hisgen's elements,

$$\text{Maximum } 2408694^{\circ}25 \text{ (G.M.T.)} \} + 17^{\circ}1207d. E. , \\ \text{Minimum } 2408688^{\circ}03 \text{ , , }$$

as published in No. 3424 of the *Astronomische Nachrichten*, agree very well with his own recent observations. From a comparison of these observations with those made by Mr. Sawyer, it appears that during the last fifteen years the magnitude of Y Ophiuchi has slightly increased, but this apparent increase may be due to the difference of observer and of observing conditions (*Astronomische Nachrichten*, No. 4030).

THE MEETING OF THE BRITISH MEDICAL ASSOCIATION.

THE seventy-third annual meeting of the British Medical Association was held at Leicester last week under the presidency of Mr. Cooper Franklin, surgeon to the Leicester Infirmary. The proceedings were conducted in twelve sections, and were well attended, nearly 1000 members registering their names.

Mr. Cooper Franklin chose for his presidential address the subject of medical education, past, present, and future. He dealt with the various Acts of Parliament regulating medical education and practice, the condition of medical education in London forty years ago, and insisted on the necessity of a good general education if the medical student were to become a good practitioner, and advocated a study of Latin and Greek. He said:—"I think the advantages of a good classical education early, to a man entering our profession, cannot be over-rated. Nothing will, or can, make up for it; there would not be so many candidates deficient in ordinary spelling and composition if there had been a good classical education. To my mind there is nothing really superior to the old-fashioned Latin and Greek training, but it seems hopeless to insist nowadays upon the retention of Greek. I think it is twenty-five or thirty years ago since, in the matriculation examination of the University of London, students were allowed to take up German instead of Greek. I venture to think that, so far as medical students are concerned, that was a retrograde step. I do not envy the student sitting down to learn his anatomy who has not learnt even a little Latin

and Greek; his Gray's 'Anatomy,' perchance, in front of him, his Latin dictionary on one side, and his Greek lexicon on the other. The student, too, must not begin to specialise too soon; he wants a liberal education, an education for its own sake. This goes when the technical education begins—that is, when he leaves school or college to learn to be a 'doctor.'

Dr. Henry Maudsley delivered an address on medicine, present and prospective, in which he discussed preventive medicine, heredity in disease, &c. He sounded a note of warning with regard to our present sanatorium treatment of tuberculosis which may be quoted:—"But is phthisis so very curable in these special hospitals, nowise endowed with any special grace, I imagine, by reason of their being called sanatoriums? Adequate statistics are not yet available, but thus far the modest outcome of experience seems to be that many patients who are sent in the early stage of the disease recover, if they are kept long enough; that most of those in a more advanced stage improve while there, frequently relapsing afterwards; and that those who are badly diseased ought not to be sent at all. Is that, after all, to say much more than might be said of sensible treatment before the erection of sanatoriums?

"Can we, again, eliminate the predisposing influence of heredity? Actual tubercle may not be inherited, but the poor constitutional soil inviting and suiting the bacillus still passes from parent to child; and we do not get rid of the essential fact by changing the name. Do we, indeed, in the end get such a valuable addition to the life-capital of the nation? It is easy enough, noting that some 60,000 consumptives die annually in England and Wales—I do not vouch for the figures—fancifully to rate the value of each life at an arbitrary figure and then by multiplication to make an appalling computation of the loss to the community; but is the loss so real? Might not the ultimate cost to the commonwealth be greater were these persons to go on living and breeding in it? An addition to the nation's life-capital is all very well, but the quality of the capital counts for a good deal, and it will not count for much if it is not realisable. What does the realisation amount to in practice? The patient who comes out of the sanatorium recovered or improved must usually go back to his former work and surroundings; he cannot adapt the world to the weakness of his nature and its ideal needs, but, like other mortals, must adapt himself to the rude world and perforce do much as they do. That is what he quite naturally does; returns to his work and his old ways, perhaps gets married if he is not married, and begets children who can hardly have the confidence of a good descent. Meanwhile, when he relapses, he sows bacilli broadcast, thus multiplying such life-capital to fulfil its ordained function in the universe, that apparently being to make away with weak mortality."

The address in surgery by Mr. C. J. Bond, surgeon to the Leicester Infirmary, dealt with ascending currents in mucous canals and gland ducts. The results of a number of experiments proved that by some means or other, and under certain conditions, particles of an insoluble substance, such as indigo, inserted into the orifices of a mucous canal or duct are conveyed along the mucous channel in a reverse direction to that taken by the contents of the tube, or by the secretion or excretion of the glands along such ducts. The conditions which seem to favour this passage are—some interference with the normal flow of the contents of the mucous tube or duct; some arrest or diversion of secretion, such as is produced by a fistulous opening, though it is by no means necessary that this should be complete.

In the section of medicine an interesting discussion on the treatment of sleeplessness was opened by Sir Lauder Brunton. Many of the speakers dwelt on the importance of indigestion and of high arterial tension in inducing sleeplessness, and Dr. Collier (Oxford) considered that much of the present day insomnia might be referred to over-education, especially in preparing for scholarships, the successful competitors often suffering after the age of nineteen years from nervous failure and insomnia. He thought that the occasional employment of narcotics was of value in breaking a vicious circle before the habit of sleeplessness was established.

In the section of State medicine an important discussion

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on hospital isolation was introduced by Dr. George Wilson (Warwick), who stated that the deductions he would bring forward were the outcome of thirty-two years' experience. With regard to small-pox isolation, he contended for a special block at the general infectious hospital, and, in his opinion, there was very little risk of the spread of infection. With regard to scarlet fever, he stated that hospital isolation had failed in reducing the incidence and mortality of the disease. He was also sure that it did not cause the presence of the milder form of the infection, and was strongly in favour of separate isolation rather than agglomeration in large wards.

Several speakers considered that hospital isolation for scarlet fever was a failure, and a resolution was adopted requesting an inquiry by the Local Government Board into the subject.

In the section of industrial hygiene the subject of physical deterioration naturally attracted a good deal of attention, and an important discussion was introduced by Dr. Dawson Williams (London), who, by means of several tables illustrating a series of observations on the height and weight of boys in primary schools, showed that after the eighth year of age the weight of boys of the artisan classes was very much below the average, this fact being more noticeable in the lowest grade schools. The same remarks applied to the height of boys, though in a less degree. The first striking statement about physical degeneration was made some years ago by Mr. J. Cantlie, who challenged any person to produce a Londoner of the fourth generation. This challenge had never been answered. Dr. Dawson Williams attributed this physical deterioration to various causes, among which he mentioned—improper feeding in infancy; the fact that among the poorer classes mothers worked hard almost up to the time of their confinement; intemperance in fathers, which was said by French authorities to be more injurious to the children than maternal intemperance; and the practice of large numbers of children in London sitting out of doors until midnight, which involved a great expenditure of nervous energy.

Mr. William Hall (Leeds), in a paper on the influence of environment on physical development, said that fifty years ago the slum mother was much more sober, cleanly, and domestic than she was to-day. She was better nourished herself, always suckled her children, and after weaning them gave them nutritious bone-making food, which she prepared at home. This had all been done away with by our elaborate education system, costing 20,000,000 yearly. Children were now fed on cheap stale food, well seasoned with condiments, which educated them for the love of stimulants in later life and produced also a tendency to scurvy, rickets, and purpura. A little while ago he had examined more than 100 adult skeletons in the crypt of Hythe Church, where they had lain for several centuries. He was struck by the fact that the bones were small but not rickety, the bony palates not much vaulted and the alveolar arches regular, and the teeth that remained were good. It had been said truly that there were hundreds and thousands of our countrymen now living whose skeletons, if preserved, would some day show highly vaulted bony palates, contracted alveolar arches, anterior protrusion of the upper jaws, the remains of unsound teeth, and abundant general signs of rickety bony framework. It was remarkable that Jewish children in the slums were superior to Christian children in physical development, which was due to the fact that the pregnant Jewess was better cared for, that 90 per cent. of the infants were fed on breast-milk, and that during later childhood they were abundantly fed on bone-making material. Eggs and oil, fish, fresh vegetables, and fruit entered largely into their diet. Yet the Jews had not been taught to safeguard their pregnant wives and to nourish their growing children by the instructors in the modern and costly State education which they were told at Oxford was to be at the root of everything.

Prof. R. J. Anderson (Queen's College, Galway) remarked that he thought it would be a most important thing to secure a complete anthropometric survey of the whole of the British Isles. He doubted if improper food was the chief cause of physical deterioration, because, in his opinion, food had of late years greatly improved in quality.

Mr. W. D. Spanton (Leeds) considered that the most prominent causes of physical degeneration were—efforts to rear premature and diseased infants, absurd educational high pressure, cigarette smoking in the younger generation, and late hours at night; in fact, the love of pleasure, and ergophobia in all classes of society. He considered that there was too much cheap philanthropy, that life was made too easy for the young poor, and that by modern educational methods proper parental discipline was rendered almost impossible.

Mrs. F. M. Dickinson Berry (London) said that in her opinion children in London schools were not underfed so much as improperly fed, and that they preferred to eat bread and pickles, dried fish, &c., and had to be forced to eat a proper dinner. She quite endorsed Mr. Hall's remarks about Jewish children.

In the section of pathology, a discussion on the relationship of heredity to disease was opened by the president, Dr. Mott (London), in an interesting and suggestive paper. He exhibited charts of hereditary haemophilia and ataxy with statistics of longevity, presenility, psychoses, and neuroses bearing on these and other diseases.

Mr. Charles Bond contributed a paper on sex-correlation and disease, with special reference to deaf-mutism. While deaf-mutism occurs almost equally in males and females, in any given family the incidence is almost limited to the members of one sex, and when members of both sexes in one family suffered the births were either twin or contiguous.

Mr. C. Hurst described experiments on the correlation of sex. When black and yellow cats were crossed, all male kittens were yellow, all female kittens tortoiseshell, but in the second generation the colours were uniformly distributed between the two sexes.

In the section of tropical diseases, an important paper on human tick fever in the Congo Free State by Dr. Todd and the late Mr. Everett Dutton was read. The conclusions arrived at were:—(1) that tick fever is clinically identical with relapsing fever, and has for a pathogenic agent a spirillum; (2) the spirillum is probably the *Spirochaete Obermeieri*; (3) a tick, the *Ornithodoros monbata*, can transmit the spirillum from animal to animal; (4) the transmission is probably not simply mechanical, but a developmental cycle is passed in the body of the tick.

In the naval and military section, Fleet-Surgeon Beadnell read an interesting paper on some dynamical and hydrodynamical effects of the modern small-bore bullet, in which he claimed that the so-called "explosive" effects of the modern bullet were due to sudden enlargement of the "impact area" resulting from a modification either in the form or in the motion of the projectile. Many of the "explosive" phenomena were due to eccentricities of flight such as the various "spinning-top" and "pirouetting" motions of the bullet.

An invitation to hold the annual meeting of the British Medical Association next year in Toronto was cordially accepted.

SOLAR AND TERRESTRIAL CHANGES.

IN a recent article we referred to the formation of an International Commission to deal with the important question of the possible action of solar changes on the earth's atmosphere. We stated that a meeting is to be held at Innsbruck in September. We are now enabled to give some details of the meeting at Cambridge last year.

The members assembled in the Old Library of Pembroke College on Thursday, August 18, and letters were read from the following:—Prof. H. H. Hildebrandsson, Prof. H. Mohn, General M. Rykatcheff, Prof. G. Hellmann, Dr. A. Paulsen, Hofrath J. M. Perner, Prof. S. P. Langley, M. A. Angot, Prof. J. Violle, Prof. J. Hann, Mr. A. S. Steen, Prof. W. Köppen, Prof. A. Riccò, Prof. G. E. Hale, Prof. F. H. Bigelow, Mr. W. G. Davis, Prof. K. Ångström, Mr. A. R. Hinks.

The members present proceeded to the election of a president and secretary, and it was unanimously resolved that Sir Norman Lockyer, director of the Solar Physics Observatory, South Kensington, be elected president, and

Sir John Eliot, of Bon Porto, Cavalaire, formerly meteorological reporter to the Government of India, secretary.

It was resolved to add the names of MM. Max Wolf, Scheiner, Julius, and Wolfer to the commission if they should be willing to serve.

At the next meeting the name of Sir Arthur Rücker was added to the commission.

The following question was considered:—

"(1) The selection of (a) meteorological, and (b) magnetic elements, which should be collated for the purpose of comparison with solar observations, and the form in which the observations might be presented with the greatest advantage for the purposes of comparison. The preparation of a list of meteorological and magnetic observatories which should be asked to contribute observations for the purpose."

It was resolved

(1) That, in the first instance, for the purpose of comparison with solar phenomena, the meteorological observations to be considered should be monthly means of pressure, rainfall and temperature (including maximum temperature and minimum temperature).

(2) That the members of the commission be requested to communicate to the secretary a short report on the data available in their respective countries, and the number of years over which they extend.

(3) That the members of the commission be requested to make suggestions with regard to additional stations from which it is desirable that data should be obtained in view of the comparison of solar and terrestrial data.

(4) That the secretary be requested to consult Dr. Chree as to the stations from which magnetic data are at present available, and to refer to a paper by Prof. von Bezold as to additional magnetic stations from which information is desirable, and to circulate the information among the members of the commission, it being understood that the data appropriate for the purposes of comparison are monthly means of the three magnetic elements for the quiet days and data as to magnetic storms.

A letter from Prof. Hale was laid before the commission.

At the third meeting the questions of the selection of meteorological stations and of the establishment of additional meteorological stations were again considered, and it was resolved that the members of the commission should hand in their list of selected stations to the secretary after the close of the British Association meeting, and that it would be desirable that observations should be obtained from two stations in the Pacific. The stations selected were Tahiti and Numea, to be established by the French Meteorological Bureau.

The name of Mr. A. L. Rotch was added to the commission.

The letter received from Prof. Hale suggesting cooperation of the commission with the committee on solar research of the National Academy of Sciences was read. It was resolved that the commission thank Prof. Hale for his letter, and express their desire to cooperate with the committee on solar research of the National Academy of Sciences on questions of common interest.

Mr. Rotch was requested to communicate this resolution personally to Prof. Hale at the conference at St. Louis.

The question of the selection of solar observations for the comparison of data was taken into consideration.

A scheme prepared by Messrs. Riccò and W. J. S. Lockyer was read and provisionally approved.

(1) *Suggested observations of the sun for direction, intensity, and amplitude of "boiling of the limb."*

Present observations:—

Twenty years' observations made in Palermo and Catania, and (?) many years' observations in Madrid.

(2) *Number, area, and position of spots.* Existing arrangements suffice.

(3) *For visual observations of prominences on limb, it is suggested that America or Japan be invited to contribute.* (Places widely separated in longitude required.)

Monthly values of the percentage frequency of prominences for every 5° of latitude north and south.

(4) *Sun-spot spectra.*

Available observations are taken at the Solar Physics Observatory, South Kensington; Poona in India; Stony-